

# A NEW COMBINATION AND NEW SUBSPECIES IN *OENOTHERA ELATA* KUNTH (ONAGRACEAE)<sup>1</sup>

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## ABSTRACT

The new combination of *Oenothera elata* Kunth subsp. *hookeri* (Torrey & A. Gray) W. Dietrich & W. L. Wagner is made for plants of moist coastal or slightly inland sandy and bluff sites from Marin County south to San Diego County, California, previously known as *O. hookeri* subsp. *hookeri* and subsp. *montereyensis*. Also, *O. elata* subsp. *texensis* subsp. nov. is described from Brazos County, Texas. It appears to be a rare relictual entity most closely related to *O. elata* subsp. *hirsutissima* which occurs disjunctly some 680 km to the west of subsp. *texensis*.

These names are made available in anticipation of their use in regional floras and concurrent studies of flavonoids, cytology, and pollen morphology in advance of a detailed revision of *Oenothera* subsect. *Oenothera* (Dietrich & Wagner, in prep.). Detailed presentation of data and discussions will be given in the revision.

Munz (1949, 1965) divided the large-flowered, bivalent-forming, outcrossing populations of sect. *Oenothera* subsect. *Oenothera* from the western United States south to Panama into two species, *O. hookeri* Torrey & A. Gray and *O. elata* Kunth. During the past ten years we have reevaluated the variation pattern of these plants by a detailed study of a large number of herbarium specimens, fieldwork, and study of plants cultivated in the experimental gardens at Düsseldorf. These studies have shown that the two entities are extremely similar and differ only in bract shape, capsule diameter, and modally in several other features. It was therefore suggested by Raven et al. (1979), in an outline of the systematics of *Oenothera* sect. *Oenothera* subsect. *Oenothera* (formerly *Euoenothera*), that they should be considered conspecific.

*Oenothera elata* can be subdivided into four subspecies: subsp. *elata* with a scattered distribution from Guanajuato, Mexico, to Costa Rica and Panama in Central America; subsp. *hirsutissima* (A. Gray ex S. Watson) W. Dietrich, which occurs in the western United States from Washington and Oregon south to northern Baja California and Durango, Mexico, and in Kansas, Oklahoma, and western Texas (Dietrich in Wagner, 1983); subsp. *texensis* subsp. nov., known only from one collection in Brazos County, Tex-

as; and subsp. *hookeri* (Torrey & A. Gray) comb. et stat. nov. occurring in moist coastal and slightly inland sandy and bluff sites in California from Marin County south to San Diego County.

The four subspecies of *Oenothera elata* can be distinguished with the following key.

## KEY TO THE SUBSPECIES OF *OENOTHERA ELATA*

- 1a. Stem, leaves, and ovary (capsule) exclusively appressed pubescent (strigillose); stem rarely with scattered pustulate hairs (muricate).
  - 2a. Stem flushed with red; the free tips of the capsule distinct ..... subsp. *hirsutissima*
  - 2b. Stem usually green; the free tips of the capsule indistinct.
    - 3a. Mature buds (excl. floral tube) narrowly lanceolate in outline, 3.5–5 cm long; sepal tips 2–3 mm long; petals 4.5–5.5 cm long; capsule 5–6.5 cm long; bracts undulate; leaves membranous; plant in cultivation up to 20 dm tall ..... subsp. *texensis*
    - 3b. Mature buds (excl. floral tube) lanceolate in outline, 2–3 cm long; sepal tips 1–2 mm long; petals 2.5–3.5 cm long; capsule 2.5–4 cm long; bracts plane, leaves somewhat leathery; plant in cultivation not more than 10 dm tall ..... subsp. *elata*
- 1b. Stem and ovary (capsule) predominantly with erect pubescence (short and long villous), stem usually with pustulate hairs (muricate) and in the region of the inflorescence with glandular hairs (glandular puberulent).
  - 4a. Stem in the region of the inflorescence without glandular hairs .... subsp. *hirsutissima*
  - 4b. Stem in the region of the inflorescence with glandular hairs.
    - 5a. Sepals green or flushed with red, without or with indistinct pustulate hairs, sparsely to scattered villous;

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- plant in cultivation more than 10 dm tall ..... subsp. *hirsutissima*  
 5b. Sepals always flushed with red, with distinct red pustulate hairs, usually densely long villous; plant in cultivation not more than 8 dm tall ..... subsp. *hookeri*

The plants described here as *O. elata* subsp. *texensis* are known only from a single herbarium specimen and from material cultivated at Düsseldorf. In 1981 Dietrich collected a seed of an unusual *Oenothera* from a TRT herbarium specimen. From the large flowers it appeared to represent *O. grandiflora* L'Hér., but when plants were grown in Düsseldorf they clearly represented *O. elata*. Further, based on its strigillose pubescence it appeared to be subsp. *hirsutissima*; however, other characters clearly separated it from both strigillose pubescent subspecies of *O. elata*, subsp. *elata* and *hirsutissima*. The stems of the Brazos County plants are always green, the capsules are 5–6.5 cm long, the buds are narrowly lanceolate, and the leaves are membranous. These plants grow tall in cultivation, to 2 m or more.

***Oenothera elata* Kunth subsp. *texensis* W. Dietrich & W. L. Wagner, subsp. nov.** TYPE: Grown from seeds taken from herbarium specimen TRT-205991 and cultivated at the Botanical Garden of the University of Düsseldorf, 12 Sept. 1984, cult. no. *Stubbe 84-204*; original source, U.S.A. Texas: Brazos Co., ca. 17 km NW of Navasota River bridge on Hwy. 6 in vicinity of Peach Creek cutoff, 25 Oct. 1978, *P. M. Catling & K. L. Intosh* (holotype, MO-3332204; isotypes, DUSS, M).

Herbae biennes, erectae, in culturam usque ad 20 dm altae. Caules virides, strigillosi. Folia undulata. Gemmae maturae (excl. tubus floralis) anguste lanceolatae, 3.5–5 cm longae. Sepala viridia, strigillosa. Petala flava, 4.5–5.5 cm longa. Stylus longus, stigmatibus supra antheras elevato. Capsulae 5–6.5 cm longae, strigillosae. Numerus gameticus chromosomaticus,  $n = 7$ ; planta chromosomatice homozygotica (7 bivalentia in metaphasium primum meiosis), autocompatibilis.

Munz (1949, 1965) recognized two subspecies of his *Oenothera hookeri* from moist coastal or slightly inland sites in California: subsp. *hookeri* and subsp. *montereyensis*. He referred plants with a bushy habit, blunt buds, free sepal tips 1–2.5 mm long, and sepals usually 2–2.5 cm long to subsp. *montereyensis*, whereas plants with a less branched habit, attenuate buds, free sepal tips 2–4 mm long, and sepals 3–3.5 cm long were referred to subsp. *hookeri*. Our studies have shown that these characters represent intra- and inter-populational variation and, further, appear to vary independently. The bushier habit of some coastal plants appears to be an adaptation to wind and salt spray. All of these populations are here treated as members of one coastal subspecies of *Oenothera elata* distinguished from the other three subspecies of *O. elata* primarily by its densely glandular puberulent and long-villous buds.

***Oenothera elata* Kunth subsp. *hookeri* (Torrey & A. Gray) W. Dietrich & W. L. Wagner, comb. et stat. nov.**

*Oenothera hookeri* Torrey & A. Gray, Fl. N. Amer. 1: 493. 1840. TYPE: California [without specific locality] *Douglas s.n.* (holotype, GH).

*Oenothera hookeri* Torr. & A. Gray subsp. *montereyensis* Munz, Aliso 2: 14. 1949. TYPE: United States. California: Monterey Co., 0.2 mi. S of mouth of Alder Creek, 6 Nov. 1934, *C. B. Wolf 6223* (RSA-12778, holotype (not seen); isotypes, GH, NY, POM).

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